

AMENDMENTS TO THE CLAIMS

Claims 5 and 30-38 were previously cancelled. This Amendment cancels claims 17 and 18 without prejudice; amends claims 1, 3, 4, 6, 8-16, 19-20, 23, 26, 27, 29, 40 and 41, and adds new claims 42-44. The following Listing of Claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims

Claim 1 (Currently amended). A sheet bending apparatus comprising:

a first shaping mold and an outline shaping mold defined as a second shaping mold, wherein

the second mold has a pair of spaced end rails and a pair of spaced central rails ~~between the spaced end rails~~, the pair of spaced end rails and the pair of spaced central rails defining a boundary around an open area and portions of the end rails and the central rails providing a sheet supporting surface, and

~~the first mold having a major surface in facing relationship to the sheet supporting surface and the open area of the second mold has a perimeter, and at least one passageway having a first end and a an opposite second end; and a major surface in facing relationship to the sheet supporting surface and the open area of the second mold, the major surface comprising a perimeter and a shaping member having a shaped press face surrounded by and a boundary, the boundary of the shaped press face shaping member within, and spaced from, the perimeter of the major surface first mold; the major surface having a marginal edge between the perimeter of the major surface first mold and the boundary of the shaped press face, shaping member and the marginal edge surrounding the shaped press face shaping member, wherein the shaped press face is a convex surface of a solid~~ and the first end

of the at least one passageway is at in the marginal edge of the major surface of the first mold;

an outer wall having an inner surface, wherein the inner surface of the outer wall defines a boundary between the first and second molds, with the sheet supporting surface of the second mold and the first end of the passageway of the first mold within boundary defined by the outer wall;

an elevator arrangement acting on at least one of the first and second molds to move the first and second molds and the outer wall relative to one another between a first position, wherein the first and second molds are spaced from one another and the outer wall is spaced from and out of contact with at least one of the first and second molds, and a second position, wherein the outer wall is between and is in contact with the first and second molds to form an enclosure wherein the first shaping mold provides one side of the enclosure, the second mold provides an opposite side of the enclosure and the sheet supporting surface of the second mold and the first end of the passageway of the first mold are within the boundary defined by the outer wall, wherein the sheet supporting surface of the second mold is in facing relationship to the major surface of the first mold, the first end of the at least one passageway at the marginal edge and the shaping member of the first mold face enclosed area of the enclosure, and fluid communication between interior and exterior of the enclosure is provided through the open area, and the at least one passageway, and wherein with a sheet to be shaped in the enclosure, peripheral edge of the sheet to be shaped is spaced from the inner surface of the outer wall.

Claim 2 (Original). The bending apparatus according to claim 1, wherein the end rails and the central rails of the second mold are continuous and form a continuous sheet supporting surface.

Claim 3 (Currently amended). The bending apparatus according to claim 1, wherein the central rails are between the spaced end rails and the central rails are secured in position, and the end rails are pivotally mounted to pivot from a first position where the end rails and the central rails provide for a generally horizontal support for a sheet to a second position where portions of the ends of the end rails are raised above the central rails.

Claim 4 (Currently amended). The bending apparatus according to claim 1, wherein the outer wall is securely attached mounted to the first mold and intersection of the inner surface of the outer wall and the major surface of the first mold defines the perimeter of the major surface of the first mold.

Claim 5 (Cancelled).

Claim 6 (Currently amended). The bending apparatus according to claim 1, wherein the outer wall is securely attached mounted to the second mold and surrounds the sheet supporting surface of the second mold~~central rails and the end rails~~.

Claim 7 (Original). The bending apparatus according to claim 1, wherein the outer wall has one part of an aligning arrangement and the first mold and/or the second mold has another part of the aligning arrangement.

Claim 8 (Currently amended). The bending apparatus according to claim 67, wherein the central rails and the end rails have a "T" shaped cross section defined as a "T" rail with horizontal member of the "T" rail having the sheet supporting surface.

Claim 9 (Currently amended). The bending apparatus according to claim 8, wherein the outer wall is securely attached connected to outer surface of the

vertical member of the "T" rail and extends away from the "T" rail and the open area.

Claim 10 (Currently amended). The bending apparatus according to claim 8, wherein the outer wall is securely attached ~~connected~~ to the horizontal member of the "T" rail and extends away from the "T" rail and the open area.

Claim 11 (Currently Amended). The bending apparatus according to claim 8, wherein the sheet supporting surface is a portion of the horizontal member of the "T" rail adjacent the open area of the second mold and the outer wall is a portion of the horizontal member of the "T" rail farthest from the open area.

Claim 12 (Currently amended). The bending apparatus according to claim 6, wherein the central rails and the end rails have an "I" shaped cross section defined as an "I" rail and upper end of the "I" rail is the sheet supporting surface of the second mold and the outer wall ~~has one end~~ is securely attached ~~mounted~~ to an outer vertical surface of the "I" rail and extends away from the "I" rail and the open area.

Claim 13 (Currently amended). The bending apparatus according to claim 1, wherein the first shaping mold further comprises a support plate and a plate member, the support plate having a perimeter, a first major surface and an opposite second major surface, wherein the plate member is secured to the first major surface of the support plate of the first shaping mold; the plate member having a perimeter, a first major surface and a second opposite major surface wherein the perimeter of the plate member is the boundary of the shaped press face, the first major surface of the plate member is in facing relationship to the first major surface of the support plate, and the second major surface of the plate member has the shaped press face; the marginal edge of the major surface of the first mold is portion of the first major surface of the support plate between the perimeter of the support plate and the perimeter of the plate member; major

surface of the first mold is the second surface of the plate member and the shaping member extends away from the second surface of the plate member, and the bending apparatus further comprising a plenum over a portion of the second major first surface of the support plate member, the at least one passageway is one of a plurality of spaced passageways wherein each one of the plurality of spaced passageways has a first end and a second end with the first end of the plurality of spaced passageways at the marginal edge and the second end selected ones of the plurality of the spaced passageways having the second end in fluid communication contact with interior of the plenum.

Claim 14 (Currently amended). The bending apparatus according to claim 1 further comprising a plenum, wherein the first shaping mold further comprises a plate member second major surface opposite to the major surface of the first shaping mold and having a first major surface and a second opposite major surface wherein the major surface of the first mold is the second surface of the plate member and the shaping member extends away from the second surface of the plate member, a the plenum is positioned over a portion of the second major first surface of the first shaping mold plate member, wherein the at least one passageway is one of a plurality of spaced passageways, and each of the passageways has a first end and a second end with the first end of selected ones of the plurality of the passageways having the first end in fluid communication contact with the interior of the enclosure at positions along the marginal edge portions of the major surface of the first mold shaping member, wherein the first end of the selected ones of the passageways is formed in the marginal edge portion facing the second mold, and the second end of the selected ones of the plurality of passageways is in fluid communication contact with interior of the plenum.

Claim 15 (Currently amended). The bending apparatus according to claim 1, wherein the at least one passageway is one of a plurality of passageways; each one of the passageways having a first end and a second end, wherein the first

end of with selected ones of the plurality of passageways having the first end is adjacent the boundary of the shaped press face shaping member of the first mold when the first and second molds and the outer wall are in the second position, wherein with the selected ones of the passageways pass passing through the outer wall and the second end of the selected ones of the passageways is at or extends extending beyond outer surface of the outer wall.

Claim 16 (Currently amended). The bending apparatus according to claim 1, wherein the at least one passageway is one of a plurality of passageways with each one selected ones of the passageways having a the first end and a second end, wherein formed in the marginal edge portion, and the first end of the selected ones of the passageways is at the marginal edge of the first mold and adjacent the boundary of the shaped press face when the first and facing the second mold molds and the outer wall are in the second position, wherein the selected ones of the plurality of passageways pass passing through the second mold and the second end of the selected ones of the plurality of passageways is accessible from the exterior of the enclosure second mold.

Claims 17 and18 (Cancelled).

Claim 19 (Currently amended). The sheet bending apparatus according to claim 2118 wherein the second chamber plenum is inside the first chamber plenum and the first chamber plenum is connected by a conduit to a vacuum pump and the second chamber plenum is connected by a conduit to a valve having a first open position and a second open position with the valve in the first open position connected by a conduit to the vacuum pump and with the valve in the second position connected by a conduit to a pressurized fluid system.

Claim 20 (Currently amended). The bending apparatus according to claim 1947, further comprising a mesh cloth securely mounted over the shaped press face of the shaping member, the mesh cloth having a predetermined weave to

provide openings of a predetermined size, wherein the size of the opening of the first end of the second plurality of passageways is equal to or less than the predetermined size of the opening of the weave of the mesh cloth overlying the opening of the first end of the second plurality of passageways.

Claim 21 (Currently amended). A sheet bending apparatus comprising:

a first shaping mold having a major surface, a perimeter, a portion of the major surface within and spaced from the perimeter comprising a shaping member having a predetermined shaped press face; a first plurality of passageways having a first end in the major surface of the first shaping mold between the perimeter of the first shaping mold and the shaping member, and a second plurality of passageways passing ~~through the shaping member and~~ having a first end at the shaped press face of the shaping member of the first shaping mold, wherein opposite second end of the first plurality of passageways is in fluid communication with a first chamber, and opposite second end of the second plurality of passageways is in fluid communication with a second chamber;

an outline shaping mold defined as a second shaping mold, the second mold having a pair of spaced end rails and a pair of spaced central rails ~~between the spaced end rails~~, the pair of spaced end rails and the pair of spaced central rails defining a boundary around an open area, wherein ~~and~~ portions of the end rails and the central rails provide providing a sheet supporting surface;

an outer wall between the first and second molds, inner surface of the outer wall defining a boundary, ~~wherein the sheet supporting surface and the first end of the passageway are within the boundary defined by the outer wall~~;

an elevator arrangement acting on at least one of the first and second molds to move the first and second molds relative to one another between a first position, wherein the first and second molds are spaced from one another and the outer wall is spaced from at least one of the

first and second molds, and a second position, wherein the first and second molds, and the outer wall form an enclosure, wherein the sheet supporting surface of the second mold and the first end of the first plurality of passageways are within the boundary defined by the inner surface of the outer wall, wherein the first shaping mold provides one side of the enclosure, and the second mold provides an opposite side of the enclosure with the sheet supporting surface of the second mold, and the first end of the second first plurality of passageways and the shaping member of the first mold in facing relationship to one another the enclosure, and ambient air is accessible to the enclosure at least through the open area of the second mold;

wherein the first plurality of passageways have a second opening positioned outside the enclosure to provide fluid communication between the first chamber and the interior and exterior of the enclosure; the second plurality of passageways provide fluid communication between the second chamber and interior of the enclosure, and each of the first end of selected ones of the second plurality of passageways has a first part and a second part, wherein the first part has an opening at the press face that has a shape and size at surface of the press face that remains constant for a predetermined distance from the surface of the press face, and the second part has an opening that is smaller than the opening of the first part decreases in size at a spaced distance from the press face to provide a stepped recess in the press face, and

a plate having a plurality of spaced holes therethrough mounted in the stepped recess.

Claim 22 (Original). The bending apparatus according to claim 21, further comprising a mesh cloth securely mounted over the press face of the shaping member, the mesh of the cloth having a predetermined weave to provide spacing of a predetermined opening, wherein the size of the opening of the holes in the

plate are equal to or less than the size of the openings in the mesh cloth overlying the holes in the plate.

Claim 23 (Currently amended). The bending apparatus according to claim 1, further comprising a mesh cloth securely mounted over the shaped press face of the ~~shaping member~~ of the first mold and at least the sheet supporting surface of the second mold.

Claim 24 (Previously presented). The bending apparatus according to claim 1 further comprising a pressing station having an upstream end and a downstream end, a heating furnace connected to the upstream end of the pressing station, a cooling furnace connected to the downstream end of the pressing station and a conveying system extending through the heating furnace, the pressing station and the cooling furnace to move the second mold along a path through the heating furnace, the pressing station and the cooling furnace wherein the first mold is mounted in the pressing station and the elevator arrangement moves the first mold toward and away from the path.

Claim 25 (Previously presented). The bending apparatus according to claim 24, wherein the elevator arrangement comprises an upper elongated rod to move the first mold toward and away from a portion of the conveying system in the pressing station and a lower elongated rod moveable toward and away from the first mold.

Claim 26 (Currently amended). The bending apparatus according to claim 25, further comprising a carriage moveable by the conveying system along the path, wherein the second mold is mounted on the carriage to move the second mold through the heating furnace and, the pressing station ~~and the cooling furnace~~, wherein the second mold moved by the carriage into the pressing station is in the first position and the lower elongated rod of the elevator arrangement moves the second mold toward the second position.

Claim 27 (Currently amended). The bending apparatus according to claim 1 further comprising a pressing station, wherein the first mold and the second mold are mounted in the pressing station, the pressing station having an upstream end and a downstream end, a heating furnace connected to the upstream end of pressing station, a cooling furnace connected to the downstream end of the pressing station furnace, a sheet conveying system extending through the heating furnace and the cooling furnace and an upstream sheet transfer device mounted for movement from a position over a portion of the conveying system in the heating furnace to a position over the second mold.

Claim 28 (Previously presented). The bending apparatus according to claim 27, further comprising a downstream transfer device mounted for movement between a position over the second mold to a position over a portion of the conveying system in the cooling furnace.

Claim 29 (Currently amended). A sheet bending apparatus comprising:

- a chamber having outer walls, an entrance end, an exit end, an entrance door and an entry into interior of the chamber exit door;
- a first shaping mold mounted in the chamber, the first shaping mold having a major surface having a shaping member having a predetermined shaped press face having a predetermined shape;
- an outline shaping mold defined as a second shaping mold mounted in the chamber in facing relationship to the press face of the first mold, the second mold having a pair of spaced end rails and a pair of spaced central rails between the spaced end rails, wherein portions of the end rails and the central rails provide a sheet supporting surface with an open area within the boundary of the sheet supporting surface;
- an elevator arrangement acting on at least one of the first and second molds to move the first and second molds relative to one another between a sheet receiving position where the first and second molds are spaced a first

distance from one another, and a sheet pressing position where the first and second molds are spaced a second distance from one another, wherein the first distance is greater than the second distance ~~a-shaped sheet between the first and second molds seals the two are closer to one another than when in the first position;~~

a vacuum pump connected to the interior of the pressing chamber to remove air from the interior of the chamber, and

a conduit having a first end connected to the open area between the shaping rails of the second mold, an opposite second end connected to an air supply outside the chamber, and a portion of the conduit between the first and second ends of the conduit extending through one of the outer walls of the chamber enclosure to move air through the conduit to the open area of the second mold, wherein air moving through conduit can only enter interior of the chamber through the open area is closed when the first and second molds are in the sheet pressing position and at least one sheet is between the press face of the first mold and the supporting surface of the second mold whereby removal of air from the interior of the chamber by the vacuum pump increases the air pressure in the conduit below the at least one sheet to bias the at least one sheet against the press face of the first mold.

Claims 30-38 (Cancelled).

Claim 39 (Previously presented). The sheet bending apparatus according to claim 29 wherein the elevator arrangement comprises a piston to move the second mold toward and away from the first mold, and the conduit comprises a passageway in the piston.

Claim 40 (Currently Amended). The sheet bending apparatus according to claim 39 wherein the outer walls of the chamber comprise an upper wall and an opposite lower wall, wherein the upper wall is above the first mold, and wherein

the vacuum pump is connected to the interior of the chamber through a hole in the upper wall ~~one of the outer walls of the chamber above the first mold to pull air from the interior of the chamber.~~

Claim 41 (Currently Amended). A sheet bending apparatus comprising:

 a first shaping mold having a major surface and a shaping member having a press face and a perimeter;

 at least one passageway extending through the shaping member, the at least one passageway having one end terminating at the major surface of the first shaping mold ~~pressing face adjacent to and outside~~ the perimeter of the shaping ~~member~~ ~~mold~~, and the opposite end of the at least one passageway terminating at a position on outer surface of the first shaping mold spaced from the shaping press face;

 an outline shaping mold defined as a second shaping mold, the second mold having a pair of spaced end rails and a pair of spaced central rails ~~between the spaced end rails~~, the pair of spaced end rails and the pair of spaced central rails defining a boundary around an open area and portions of the end rails and the central rails providing a sheet supporting surface;

 an outer wall securely attached ~~mounted~~ to the second mold, inner surface of the outer wall surrounding and spaced from the sheet supporting surface, ~~and spaced from and surrounding the sheet supporting surface~~ of the second mold, and

 an elevator arrangement acting on at least one of the first and second molds to move the first and second molds relative to one another between a first position, wherein the first and second molds are spaced from one another and the outer wall is spaced from ~~at least one of the first mold and second molds~~, and a second position, wherein the first and second molds, and the outer wall form an enclosure wherein the first shaping mold provides one side of the enclosure, the second mold provides an opposite side of the enclosure, ~~the wall mounts the press~~

~~face between the perimeter of the shaping member and the first end of the at least one passageway, and the inner surface of the outer wall surrounds the first end of the at least one passageway sheet supporting surface of the second mold.~~

Claim 42 (New). The bending apparatus according to claim 1 wherein the open area is closed when the first and second molds are in the second position and at least one sheet is between the shaped press face of the first mold and the supporting surface of the second mold whereby removal of air from interior of the enclosure through the at least one passageway increases air pressure in the open area below the at least one sheet to bias the at least one sheet against the press face of the first mold.

Claim 43 (New). The bending apparatus according to claim 1 wherein surface of the shaped press face is a non-porous surface.

Claim 44 (New). The sheet bending apparatus according to claim 21 wherein the first part is a circular hole having a first constant diameter and the second part is a circular hole having a second diameter smaller than the first diameter.